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Vol. VI., No. 53.] BULLETIN OF THE TORREY BOTANICAL CLUB. [New York, May, 1879.

§ 308. Notes on the Relative Age and Dimensions of a Number of Different Trees.

The subject of the annual growth of trees is one about which little seems to be known in comparison with its importance. Of course it is generally believed that there is a difference in different species in the amount of this annual increase of dimensions, but there is apparently nothing on record as to any exact observations of the number of years which must elapse before we may expect a sapling to become a tree of given dimensions. Having had opportunities during this past winter to measure a large number of trees, I have taken a series of notes on the subject, to the results of which I propose to call attention.

And first a short description of the methods employed in obtaining the measurements will not be out of place. Three separate notes were taken from each individual tree examined; (1) its age; (2) its height; (3) its butt circumference. The age has been determined either from actual knowledge of the date when the trees were planted, or by counting the annual rings in the case of felled trunks, which latter may be a year or two in error in a few cases, owing to the difficulty in counting when the rings are obscure or very close together. In regard to the heights, trees which are still standing were measured by means of horizontal base lines and the corresponding angles of elevations, which were taken with a rough instrument and are approximate, the error in the height amounting to perhaps three feet in extreme cases.

Trees which had been felled were measured directly by a tape line.

The circumferences of the butts were measured, in most cases, at about three feet above the ground.

These notes were tabulated, and those for each species averaged. Then assuming the section of the trunk to be a circle, average circumferences were reduced to corresponding diameters. By dividing the average height by the age, the average vertical growth per annum was obtained. Applying the same operation to the average diameter, the quotient gives the average yearly increase in the thickness of the trunk, at its base, and one-half of this is the average thickness of the annual ring for that particular species.

The notes were all nearly taken near New Dorp, S. I., over an area of perhaps three square miles, so that the differences in soil, rainfall, etc., must be small, and I think may be neglected.

It is to be born in mind that the average rates of growth given in the foregoing table do not apply to the trees at every period of their existence. All trees grow much more rapidly vertically when they are young; the yearly increase in diameter is a more constant quantity, but there is a slight decrease in the ring thickness as they grow older, which is especially noticeable in the case of old trees, and where much crowding has taken place. N. L. BRITTON.

The following table gives a summary of these observations.

NAME OF TREE.	Average Age in Years.	Average Annual Increase in Diameter.	Average Annual Ring Thickness.	Average increase in Height per year.	No. of Trees on which the Average was taken.	Relative Rapidity of Vertical Growth.	Relative Thickness of the Annual Ring.
Abies excelsa	32.6	0.61″	0.30″	1.73′	3	1	3
Salix alba	32	1.06″	0.53″	1.62′	3	2	1
Liriodendron	38	0.45″	0.22″	1 57′	1	3	13
Abies balsamea	30	0.38″	0.19″	1.56′	8	4	16
Juglans nigra	26	0.41″	0.20″	1.55′	2	5	15
Larix Europæa	34	0.29″	0.15″	1.53′	3	6	21
Pinus Strobus	27	0.51″	0.25″	1.52′	1	7	10
Acer rubrum	28.4	0.45″	0.22″	1.51′	5	8	14
Ailanthus	31	0.59″	0 29″	1.46′	11	9	4
Prunus Cerasus	29	0.54″	0.27″	1.40′	7	10	7
Catalpa	32	0.55″	0.28″	1.39′	5	11	6
Betula alba, *var.* populifolia	34	0.18″	0.09″	1.32′	3	12	26
Ulmus Americana	38	0.52″	0.26″	1.31′	2	13	8
Paulownia	31	0.58″	0.29″	1.29′	1	14	5
Aplpe-trees	23	0.65″	0.32″	1.23	6	15	2
Pinus mitis	38	0.45″	0.23″	1.18′	2	16	12
Pinus rigida	36.2	0.31″	0.15″	1.17′	5	17	20
Thuja occidentalis	28	0.32″	0.16″	1.15′	3	18	19
Castanea vesca	52.3	0 51″	0.25″	0.95′	7	19	9
Sassafras	27.1	0.23″	0.12″	0.96′	8	20	23
Carya tomentosa	70.4	0.20″	0.10″	0.95′	5	21	24
"Black Oak." (Q. rubra?)	37	0.47″	0.24″	0.94′	4	22	11
Quercus alba	47.3	0.35″	0.18″	0.88′	6	23	17
Fagus ferruginea	44.8	0.36″	0.18″	0.78′	5	24	18
Diospyros	52	0.27″	0.13″	0.67′	1	25	22
Juniperus Virginiana	59.7	0.21″	0.10″	0.58′	12	26	25

§ 309. **Vitis.**—In the June number of last year I have enumerated some of the characters which distinguished *Vitis riparia* from *cordifolia*. I can now confirm all I have said there. Our present spring being later than the very precocious one of last year, *riparia* bloomed about May 10th and *cordifolia* begins now, May 27, to open.

Another, and a very valuable, character to distinguish *riparia* not only from *cordifolia*, but from all other species of *Vitis* has been